Alaska Department of Fish and Game
Division of Wildlife Conservation
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Furbearer Management Technique Development

Howard N. Golden

Research Performance Report
1 July 2001–30 June 2002
Federal Aid in Wildlife Restoration
Grant W-27-5, Study 7.19

This is a progress report on continuing research. Information may be refined at a later date.

FEDERAL AID
ANNUAL RESEARCH PERFORMANCE REPORT

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 25526
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PROJECT TITLE: Furbearer management technique development

PRINCIPAL INVESTIGATOR: Howard N. Golden

COOPERATORS: Mike Anthony, Biological Resource Division of USGS; Robert Skinner, Innoko National Wildlife Refuge; Nikolina Guldager, Yukon-Charley National Park; Brad Shults, Western Arctic National Parklands; Merav Ben-David, University of Wyoming; Pamela Groves, University of Alaska Fairbanks; and Joseph Cook, Idaho State University.

FEDERAL AID GRANT PROGRAM: Wildlife Restoration

GRANT AND SEGMENT NR.: W-27-5

PROJECT NR.: 7.19

WORK LOCATION: Nelchina Basin, Kenai Peninsula, Prince William Sound, Yukon-Charley Rivers Basin, and western Brooks Range.

STATE: Alaska

PERIOD: 1 July 2001–30 June 2002

I. PROGRESS ON PROJECT OBJECTIVES

OBJECTIVE

The objective of this study is to develop and test techniques that may be useful for management of furbearer populations in Southcentral and other regions of Alaska.

This study encompasses 6 projects indicated below as job objectives. Each job objective has its own set of objectives. This is the first performance period of project 7.19.

JOB OBJECTIVES:

OBJECTIVE 1: Aerial track count techniques

1. Determine the most effective camera settings, aircraft speed and aircraft type for recording and enumerating furbearer tracks with the digital video system.
2. Determine the most efficient design for transect placement considering topography and aircraft type.
3. Estimate the accuracy of aerial counts versus ground counts.

4. Estimate the level of correction needed to account for sightability differences among vegetation cover classes.

Progress on the above objectives included preparation of an interagency study plan and conducting tests of the digital video system and track-transect techniques.

OBJECTIVE 2: Accuracy of wolverine density estimation techniques

Assess the accuracy and relative precision of wolverine density estimates derived from line-intercept and network sampling techniques.

Progress on this objective was focused on preparing manuscripts from work conducted on study 7.18. See Job 6 and section IV below. Field conditions were not favorable for testing the accuracy of the density estimation technique.

OBJECTIVE 3: River otter habitat selection and population monitoring

1. Determine if latrine site use and fecal deposition rates are precise indicators of river otter abundance in coastal areas of southcentral Alaska.
2. Determine which habitat features are most important in defining coastal river otter habitat.

For objectives 1 and 2, progress involved surveying river otter latrine sites by boat along the coastline of eastern Prince William Sound. Work in this area of PWS will broaden our understanding of river otter populations throughout the sound. Progress on objective 1 also involved preparation of a manuscript of river otter latrine site use.

3. Estimate sustainable harvest levels of river otter populations in coastal environments of southcentral Alaska.

Progress on this objective will follow completion of objectives 1 and 2.

OBJECTIVE 4: Lynx population monitoring and modeling

1. Continue to modify and enhance the lynx management model used in the tracking harvest strategy in southcentral Alaska.

Progress on this objective involved the assessment and purchase of new software to allow better use of the lynx management model.

2. Continue to analyze reproductive and other biological data from lynx carcasses.

We continued our purchase of lynx carcasses from trappers (as with project 7.18) to measure lynx reproductive parameters for use in the lynx management model. These data were used to recommend changes in lynx trapping regulations.

OBJECTIVE 5: Miscellaneous investigations

1. Collaborate in a project to determine the morphologic and genetic variation of wolverines in southcentral Alaska.

Progress involved the purchase of wolverine carcasses for DNA sampling and archiving the samples.

2. Estimate prey selection patterns and prey switching in lynx during their 9–11-year cycle.

Progress involved collecting and archiving muscle tissue samples from lynx carcasses purchased from trappers

OBJECTIVE 6: Publications and meetings

Prepare manuscripts for publication from studies 7.18 and 7.19.

As senior author or coauthor, I completed or made progress on several manuscripts related to Projects 7.18 and 7.19. I also represented the department at the National Furbearer Managers Workshop on Best Management Practices for Trapping in Council Bluffs, Iowa, 29 April–2 May 2002.

II. SUMMARY OF WORK COMPLETED ON JOBS IDENTIFIED IN ANNUAL PLAN THIS PERIOD

JOB 1: Aerial track count techniques

The cooperators and I prepared an interagency study plan for this project (Appendix A). The cooperators conducted tests of the digital video system and track-transect techniques and we began analysis of digital images to measure image resolution and track sightability. I did not participate in fieldwork on this task but provided consultation and analysis before and after the fieldwork was completed.

JOB 2: Accuracy of wolverine density estimation techniques

All progress on this job involved the completion or preparation as senior author or coauthor of 4 manuscripts for publication: (1) immobilization of wolverines, (2) predation on wolverines by wolves, (3) rates and causes of wolverine mortality, and (4) spatial use patterns and habitat selection of wolverines (see section IV and Appendix B). Field conditions were not favorable for testing the accuracy of the density estimation technique.

JOB 3: River otter habitat selection and population monitoring

We surveyed 92 river otter latrine sites by boat along the coastline of eastern Prince William Sound. We searched for new latrine sites, examined each site for use, and rated the habitat characteristics of each site in preparation for relative abundance surveys during the next performance period. I also conducted statistical analysis of river otter latrine-site use and scat counts for data collected in Prince William Sound and Kachemak Bay during study 7.18. I began preparation as senior author of a manuscript of river otter latrine site use (see section IV).

JOB 4: Lynx population monitoring and modeling

I assessed and purchased new expert-system software to improve the performance and user interface of the lynx management model, LynxTrak. The new software is produced by Exsys, Inc., which also made the software we have used to run the model. I purchased 31 female lynx carcasses (at $15/carcass) from trappers in Units 7, 13, and 15 and examined them for reproductive parameters and body condition. I analyzed lynx, snowshoe hare, and harvest trend data as well as area biologist observations for use in LynxTrak. In

consultation with area biologists, I used the model results to recommend season changes for lynx harvest in southcentral Alaska.

Job 5: Miscellaneous investigations

During this performance period, we purchased 18 wolverine carcasses (at $25/carcass), sampled tissue for DNA analysis, and archived samples. We also collected tissue samples from 31 lynx carcasses purchased from trappers and archived the samples for stable isotope analysis during the next performance period.

Job 6: Publications and meetings

As senior author or coauthor, I completed or made progress on 5 manuscripts related to current and previous work on Jobs 2 and 3 for (Grants W-23-3, W-24-4, W-24-5, W-27-1, W-27-3, and W-27-4). See section IV and Appendix B. I also participated in the National Furbearer Managers Workshop on Best Management Practices for Trapping in Council Bluffs, Iowa, 29 April–2 May 2002.

III. ADDITIONAL FEDERAL AID-FUNDED WORK NOT DESCRIBED ABOVE THAT WAS ACCOMPLISHED ON THIS PROJECT DURING THIS SEGMENT PERIOD

1. I supervised the Fish and Wildlife Technician (FWT) positions for the Region II Research Section assigned to the Anchorage office. These positions provide support to all research biologists in Region II. This duty, which I have conducted since March 1995, involves hiring, supervising, and coordinating the work of a FWT IV and FWT III. Both positions are 11-month permanent-seasonal (P-S). In addition, I am responsible for hiring and supervising other temporary technicians or interns to assist seasonally as needed. During this performance period, I hired 2 P-S FWT III positions, rewrote position descriptions, and upgraded 2 FWT IIIs to FWT IV positions. I also hired and supervised 2 non-permanent FWT IIIs to assist with short-term fieldwork needs. I wrote evaluations and handled all personnel issues for these positions.

2. At the request of the Furbearer Resources Technical Group of the International Association of Fish and Game Agencies, I coauthored a brochure intended as a guide to trappers to help them avoid catching lynx while trapping bobcats and other furbearers. The brochure was prepared, in response to new federal regulations, for the U.S. Fish and Wildlife Service to print and distribute to trappers in the states where restrictions on lynx trapping apply. The introduction of the brochure is presented in Appendix C.

IV. PUBLICATIONS

Journal articles

Golden, H. N., B. S. Shults, and K. E. Kunkel. 2002. Immobilization of wolverines with Telazol from a helicopter. Wildlife Society Bulletin 30: 492–497.

White, K. S., H. N. Golden, K. J. Hundertmark, and G. R. Lee. *In press*. Predation by wolves, *Canis lupus*, on wolverines, *Gulo gulo*, and an American marten, *Martes americana*, in Alaska. Canadian Field-Naturalist 000: 000–000.

Krebs, J., E. Lafroth, J. Copeland, V. Banci, D. Cooley, H. Golden, A. Magoun, and R. Mulders. *In review*. Rates and causes of mortality in North American wolverine. Journal of Wildlife Management 000: 000–000.

Golden, H. N., and K. S. White. *In preparation*. Wolverine (*Gulo gulo*) spatial use patterns and habitat selection in southcentral Alaska. Journal of Mammalogy 000: 000–000.

Golden, H. N., and M. Ben-David. *In preparation*. Monitoring river otter latrines to index population trends: Is it a reliable tool? Journal of Mammalogy 000: 000–000.

Brochure

Golden, H., and T. Krause. *In review*. How to avoid accidentally harvesting lynx while trapping or hunting bobcats and other furbearers. Prepared for the International Association of Fish and Wildlife Agencies and the U.S. Fish and Wildlife Service.

V. RECOMMENDATIONS FOR THIS PROJECT

Following this first year of project 7.19, I recommend continuing with the objectives and jobs specified in the study plan for the next performance period.

VI. APPENDIX

A. Interagency study plan summary for Job 1:

Golden, H., N. Guldager, M. Anthony, and R. Skinner. 2002. Development and testing of aerial videography techniques to monitor furbearer populations. Interagency Collaborative Project Study Plan, Alaska Department of Fish and Game, National Park Service, Biological Resource Division of U.S. Geological Service, and U.S. Fish and Wildlife Service, Anchorage, Alaska.

Summary: Biologists from the Alaska Department of Fish and Game, Alaska Biological Science Center, U.S. Fish and Wildlife Service and Yukon-Charley Rivers National Preserve are working together to develop a technique to monitor lynx (*Lynx canadensis*), marten (*Martes americana*), red fox (*Vulpes vulpes*), and coyote (*Canis latrans*), and snowshoe hare (*Lepus americanus*) populations from snow track surveys with airborne digital videography. In February 2001, flights were conducted in Yukon-Charley over complex hilly terrain to determine optimum survey altitudes and camera settings under various lighting and snow conditions. Results from this preliminary fieldwork demonstrated that videographic surveys from 270 to 90 m above-ground-level were a great improvement in precision, detection of tracks, and safety over the current technique that employs an experienced observer flying at lower altitudes. Furthermore, the new technique provides GPS locations for each track, which provides the potential for geospatial analysis and determining habitat relationships. Statisticians associated with the interagency group have adapted the line-intersect sampling design from the ocular survey to accommodate the new technique. Currently we are using computer simulations to evaluate its efficiency and precision at varying population levels for different species of interest. Plans for winter 2002 include developing visibility correction factors from

comparison of ground-based and aerial surveys and additional experimental surveys over other terrain in Yukon-Charley and Innoko NWR.

B. Abstracts of journal articles for Jobs 2 and 3:

Golden, H. N., B. S. Shults, and K. E. Kunkel. 2002. Immobilization of wolverines with Telazol from a helicopter. Wildlife Society Bulletin 30: 492–497.

Abstract: Chemical immobilization of wildlife from a helicopter requires use of a drug dose that is adequate to sufficiently anesthetize an animal for handling, and a potent but safe drug is preferred. We assessed effectiveness of Telazol® to immobilize free-ranging wolverines (*Gulo gulo*) by darting them with a standard dose of 175 mg from a helicopter in Alaska, 1992–1999. Induction occurred in 3.7±0.3 minutes, with no difference between genders (χ^2_1 = 1.35, P = 0.245) despite dimorphism in body mass. Initial sedation was 47.1±9.6 minutes and was usually sufficient for handling, but approximately one third of the wolverines required additional doses of 50–100 mg to maintain sedation. Initial sedation and recovery (95.5±11.2 minutes) were related positively to dosage (mg/kg, r = 0.76, P < 0.004 and r = 0.90, P < 0.001, respectively). We conclude that Telazol is an effective and safe drug to immobilize wolverines from a helicopter. We recommend projecting it as a standard dose in a small dart at low power to minimize injury and then supplementing as needed to maintain sedation.

White, K. S., H. N. Golden, K. J. Hundertmark, and G. R. Lee. *In press*. Predation by wolves, *Canis lupus*, on wolverines, *Gulo gulo*, and an American marten, *Martes americana*, in Alaska. Canadian Field-Naturalist 000: 000–000.

Abstract: We report three instances of wolf predation on mustelids in Alaska; two involved wolverines and another involved an American marten. Such observations are rare and in previous studies usually have been documented indirectly. This account provides insight into the potential role of wolves in influencing mesocarnivore communities in northern environments.

Krebs, J., E. Lafroth, J. Copeland, V. Banci, D. Cooley, H. Golden, A. Magoun, and R. Mulders. *In review*. Rates and causes of mortality in North American wolverine. Journal of Wildlife Management 000: 000–000.

Abstract: Understanding vital rates is fundamental to the evaluation of conservation options for wolverines (*Gulo gulo*). We estimated survival rates for wolverine in trapped and un-trapped populations within montane, boreal, and tundra environments using data from 12 North American radio-telemetry studies carried out between 1972 and 2001. Survivorship rates were estimated for males and females, and adults and subadults using Kaplan-Meier staggered entry techniques. Rates were based on data for 62 mortalities of 239 radiotagged wolverines monitored over 207 wolverine-years. Mortalities included 22 trapped/hunted, 3 road/rail kill, 11 predation, 18 starvation and 8 unknown. Survival was substantially lower in trapped (< 0.75 for all sex/age categories) than untrapped (>0.84 for all sex/age categories) populations. Human-caused mortalities should be considered additive to natural mortality in a management context. Logistic growth rate estimates suggest that trapped populations are declining ($\lambda \cong 0.88$) in absence of dispersal

from untrapped populations ($\lambda \cong 1.06$). We recommend a system of spatial harvest controls in northern continuous populations of wolverine and curtailment of harvest along with more conservative measures in southern metapopulations.

Golden, H. N., and K. S. White. *In preparation*. Wolverine (*Gulo gulo*) spatial use patterns and habitat selection in southcentral Alaska. Journal of Mammalogy 000: 000–000.

Abstract: Wolverines are wide-ranging medium-sized carnivores that occur at naturally low densities throughout their circumboreal distribution. As opportunistic scavengers, variability in socially-mediated, sex-specific selection pressure may result in corresponding variation in wolverine foraging ecology and consequent differences in home range utilization and habitat selection. Further, because of recent conservation concern for wolverine populations in many parts of North America, detailed understanding of factors influencing the spatial ecology of wolverines is needed. We used field-based GPS location data combined with GIS habitat and topographic coverages to test hypotheses regarding sex- and age-specific spatial use patterns and multi-scale habitat selection for a population of radiocollared wolverines in a 6000 km^2 study area located in southcentral Alaska. Overall, we found that female wolverines used smaller home ranges (224–1337 km^2, n = 3) than males (930–1137 km^2, n = 4) and subadult wolverines tended to have spatial use requirements similar to other animals in their sex class (females: 342–358 km^2, n = 2; males: 913 km^2, n = 1). Preliminary compositional analysis of sex-specific habitat selection indicated that female wolverines used rock outcrop and alpine habitats more frequently than did male wolverines at intermediate spatial scales. We also investigated the influence of topographic features (elevation, slope and aspect) on patterns of wolverine occurrence. Our results document sex-based variation in wolverine spatial ecology and, within the context of other studies, feature insights into wolverine habitat use and home range requirements that enhance our ability to conserve and manage wolverines in northern environments.

C. Introduction of lynx trapping brochure for Section III, Additional Work:

Golden, H., and T. Krause. *In review*. How to avoid accidentally harvesting lynx while trapping or hunting bobcats and other furbearers. Prepared for the International Association of Fish and Wildlife Agencies and the U.S. Fish and Wildlife Service.

Lynx are listed by the U.S. Fish and Wildlife Service as a threatened species in 14 northern states. Lynx harvests are no longer permitted in any state except Alaska. Bobcat harvesting, whether by trapping or hunting, is not affected by this ruling. However, trappers and hunters must use every reasonable effort to avoid taking lynx where the ranges of the two species overlap. In the contiguous 48 states, resident populations of lynx occur in Maine, Montana, Washington and Wyoming, but lynx may also be encountered in Colorado, Idaho, Michigan, Minnesota, New Hampshire, New York, Oregon, Utah, Vermont and Wisconsin. Bobcats and lynx are very similar in appearance and habits. Therefore it is important for hunters and trappers to know how to identify both species; learn to recognize the preferred habitat types of both species; learn to avoid accidental taking of lynx, and learn what to do if a lynx is caught accidentally. This brochure provides key information and important tips to help bobcat hunters and trappers achieve success.

VII. PROJECT COSTS FOR THIS SEGMENT PERIOD

FEDERAL AID SHARE $ 57,635 STATE SHARE $ 19,211 = TOTAL $ 76,846

VIII. PREPARED BY:

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